

REMARKS

Summary

Claims 12-19 and 21-25 are pending. Claim 20 is hereby cancelled. New claims 26 and 27 are added by this amendment. **Claims 12-19, 21-27 remain in the application.** Reexamination and reconsideration of this application is requested.

Review

Claims 12-25 have been rejected as unpatentable in view of Pileggi et al. (USPN 5488912). Pileggi et al. disclose polymer-covered cloth panels to use to support bulk cargo inside railway cars. In a final office action dated 12/18/2003, it was stated in section 4 that "...it is the Examiner's position that the car body of Pileggi et al. can be equated to the wall of the present invention. Furthermore, the polyurethane coating would inherently adhere the fabric of Pileggi et al. to the car body."

Adhesion

As background, it should be noted that "adhesion" is used herein in the sense noted in the response to the first office action dated 09/15/2003: "molecular attraction exerted between the surfaces of bodies in contact."

A familiar example of molecular adhesion is ordinary glue. If one spreads glue onto a piece of paper and places the wet glue in contact with a second piece of paper, the two pieces of paper will be glued together. That is, after the glue dries, the papers remain attached by molecular attraction between glue and paper. If the glue dries *before* contacting the second paper, the glue is adhered to the first piece but cannot adhere to the second piece. In this case, the papers can only be attached to each other by mechanical means, for example, a paper clip.

Pileggi et al. do not teach or suggest that their panels are adhered to the rail car by polyurethane, as asserted in the Office Action. Instead, there are at least two pieces of evidence to the contrary.

First, Pileggi et al. state in column 4, lines 25-29, “The side wall panels 56, of composite sheet material, the end transition panels 58, and the bottom panels 60 are all generally rectangular and are **attached to the respective elements of the structural frame of the car by elongate clamp assemblies 68 or 70**”...(emphasis added). Clamp assemblies 68 are seen in environmental view in Figure 4 and in detailed sectional views in Figures 6-8.

It is improbable that Pileggi et al. would have chosen to attach the panels to the frame members of the railway car by these bulky and heavy mechanical clamp assemblies if there were some manner in which the fabric could “inherently adhere” to the frame members.

The second evidence that the panels are not adhered to the frame members is the statement in column 5, lines 45-51, “As a desired result, when tension in the tubular margin 108 is relaxed ... it is possible for portions of the tubular margin 108 of the panels to move slightly and thus adjust their positions”.... The adhesive force of polyurethane is not known to release when tension is relaxed.

The Office Action states in section 4, “...regardless of the intermediate steps required to form the article, the resulting final product is the same.” To the contrary, in the case of a material that undergoes a major change during processing, such as a liquid polymer precursor cured to form rubber, the method does affect the final product. When a liquid polyurethane precursor is applied to a wall of a suitable material and subsequently allowed to cure while in intimate contact, the adhesion of the cured polyurethane to the wall is likely to be very strong.

The present invention is a composite coating that is applied *in situ* to a wall. A piece of textile material is embedded in the uncured or “wet” coating, and then another layer of uncured coating is sprayed over the textile. Because the coating is sprayed onto the wall as a liquid, intimate contact results and the

cured coating adheres by attractive forces between the molecules of polyurethane and molecules of the wall. The present invention does not require clamp assemblies or other mechanical attachment means. By “composite” is meant a polymeric material reinforced by a fibrous material.

Pileggi et al. give no indication that the polyurethane coating comes anywhere near a railway car before it is fully cured, and thus incapable of adhesion. The Pileggi et al. polyurethane coating is not directly applied to the framework of the railway car and does not adhere to the car in the course of curing. The panels of Pileggi et al. are equivalent to the piece of paper with dried glue discussed above; the clamp assembly is equivalent to the paperclip.

The Examiner notes in section 7 of the Office Action, “While this may be true, Pileggi et al. disclose a two-part polyurethane casting elastomer, **which inherently would be applied one part at a time.**” The significance of this point is not understood. Pileggi et al. do not teach that an elastomer is applied one part at a time. Such a method is not known practice. The present application states that the two-part elastomer is either pre-mixed (page 6, lines 28-30) or applied by a mixing gun (page 6, lines 19-22) as depicted in Figure 1 and therefore both parts are applied at the same time in proper stoichiometric ratio.

Wall

The present invention is a composite coating applied to the surface of a wall. By “wall” is meant “a material layer enclosing space” or “one of the sides of a room or building connecting floor and ceiling or foundation and roof” as defined by *Merriam Webster's Collegiate Dictionary*, Tenth Edition.

It was stated in the Office Action (section 7) that “... the car body of Pileggi et al. can be equated to the wall of the present invention. Furthermore, the polyurethane coating would inherently adhere the fabric of Pileggi et al. to the car body.” Because this statement refers to adhering the fabric *to* the car

body, it appears that “car body” is intended to mean the structural frame portion of the rail car. The structural frame includes side wall upright members 40, horizontal transverse braces 52, center sill 32, lower side sills 34,36, and various other frame members fabricated from rolled steel or extruded aluminum, as noted by Pileggi et al. in column 3, line 47 through column 4, line 13. These generally linear frame members “define the **location** of an upstanding side wall 44” (column 3, line 62, emphasis added), but the portion of side wall 44 that is a wall in the sense of a “material layer enclosing space” is the fabric panels themselves. To state it simply, if the panels *are* the walls, they cannot be *attached to* the walls.

In section 4 of the Office Action, it was stated, “With regard to the newly added amendment of a ‘wall having a surface,’ it should be noted that Pileggi et al. discloses **that the panels that are structural components of the car body** (abstract).” [Emphasis added.] With respect, the meaning of this statement is not understood.

For these reasons, it is not correct to equate Pileggi’s invention, a lightweight movable wall, to the present invention, a coating attached by molecular adhesion to the surface of an existing wall of a structure for the purpose of increasing the structure’s resistance to explosion. The Pileggi et al. patent does not include any suggestion or teaching of anything attached to a surface of a wall. The only adhesion noted in the Pileggi et al. patent is that of the polyurethane to the fabric.

Amendments to Claim 12

Claim 12 is hereby amended to more particularly distinguish the invention from that of Pileggi et al. The layers of elastomer are specified as “in intimate contact with and adhering permanently to” the surface below. This amendment is supported by the explanation in the specification of the method by which the elastomer is applied as a fluid precursor that cures in place to form an elastomer page 5, lines 16-34, and by Figure 2.

Claim 12 is also amended to more particularly distinguish the function of the composite coating “to increase the apparent ductility and elongation of the wall when sudden lateral or explosive force is applied to the structure.” This statement of the function of the coating is supported in the specification on page 5, lines 21-23.

Pileggi et al. do not teach or suggest that the “wear-resistant polymeric material” applied to their flexible panels increases apparent ductility and elongation of the panels, nor do they suggest that such a modification of the fabric is possible or desirable.

To the contrary, because Pileggi et al. frequently state that the central portion of the cloth is not saturated with polyurethane so as to allow the panel to “carry tensile stress loads” they are teaching away from increasing apparent ductility and elongation of the panels (column 6, lines 57-59, for example). Claim 1 specifies that the polyurethane [wear-resistant flexible material] extends “into said primary layer [cloth] less than half said primary layer thickness, leaving a central portion of said primary layer free from said flexible material....” Claim 10 reiterates this.

The Examiner has equated the railway car body of Pileggi et al. to the wall of the present invention. Pileggi et al. do not disclose that the polymeric material that coats their panels can function to **adhere** the panels to the railway car body. On the contrary, Pileggi et al. teach that the panels are mechanically attached to the “structural frame of the car by elongate clamp assemblies.” Pileggi et al. do not teach or suggest that their polymeric material is in “**intimate contact**” with the railway car body. Pileggi et al. do not disclose or suggest that their polymeric material is in any sense “**permanently**” attached to the railway car body. On the contrary, Pileggi et al note that the edges of the panels can “move slightly and thus adjust their positions” even while attached. The elongate clamp assemblies can also be detached.

In claim 12 of the present application, as currently amended, it is taught that the second layer of elastomer is “in intimate contact with and adhering permanently to said first layer.” The fabric is embedded between the two layers but does not completely separate them.

Pileggi et al. do not teach that the two layers of polymeric material that coat the fabric of their panels are in “intimate contact” with each other. To the contrary, they teach, as in their claim 1, that each layer of “wear-resistant flexible material” extends less than half-way into the fabric, “leaving a central portion of said primary layer free from said flexible material.” The reason for

not allowing the layers of polymeric material to contact each other is stated in column 6, lines 57-59: "The central portion 150 of the cloth, however, may remain unimpregnated and thus free to flexibly carry tensile loads."

Pileggi et al. do not disclose or teach any means by which a wall is strengthened against explosive forces. Their claim 1 claims "sheet material for carrying primarily tensile loading..." However, the present application is for a coating that reinforces "structures 100 such as buildings, bridges, storage tanks, piping, walls 101, floors 103, columns, and airplane bulkheads to increase their resistance to unusual forces. The potential forces may be those anticipated from explosion of hazardous materials such as petroleum products, steam, munitions, or reactive chemicals, may result from sabotage or terrorist attack, or may be due to an earthquake." (Page 5, lines 8-14.) As noted in the Background of the Invention (page 1, lines 21-24) "Explosion forces often radiate in all directions and may change directions during the course of the blast. Thus, the forces from an explosion are not necessarily along vectors where typical load forces were expected." The present invention is intended to be used on a well-constructed structure that is already designed to "carry tensile loading," compressive loading, or typical shear forces such as from wind. The present invention is for improving the structure's strength against forces of unusual strength or direction.

Pileggi et al. do not disclose or suggest a coating to strengthen a wall against explosion forces, an elastomer in intimate contact with and adhering to a surface of a wall, nor a textile that is embedded between two layers of elastomer in intimate contact with each other. Pileggi et al. do not disclose or suggest any means to increase the apparent ductility and elongation of a wall. From these reasons and the explanations given above, amended claim 12 is seen to be in condition for allowance and allowance is requested.

Other Claims

Claim 13, being dependent upon now-allowable claim 12 and reciting further patentable subject matter, is seen to be allowable and allowance is requested.

Claim 14 is currently amended to point out that the spacing apart of the textile yarns is "so as to

create openings in said textile penetrable by said fluid precursor.” Openings 45 in the textile are supported in the specification (page 8, lines 18-19) and in Figure 1.

Claim 15 is currently amended to more clearly claim the finished article, not the method by which it is produced. Amended claim 15, dependent upon now-allowable claim 12 and reciting further patentable subject matter, is seen to be in condition for allowance and allowance is requested.

Claims 16 and 17 are currently amended such that the language is congruent with that of amended claim 15. Being dependent upon now-allowable claim 15 and reciting further patentable subject matter, claims 16 and 17 are seen to be in condition for allowance and allowance is requested.

Claim 18, being ultimately dependent upon now-allowable claim 12 and reciting further patentable subject matter, is seen to be allowable and allowance is requested.

Claim 19 is amended similarly to claim 12. For the reasons set forth in the section above titled **Amendments to Claim 12**, claim 19 is seen to be in condition for allowance and allowance is requested.

Claim 20 is cancelled.

Claim 21 is currently amended to be dependent upon now-allowable claim 19 and reciting further patentable subject matter; claim 21 is seen to be allowable and allowance is requested.

Claims 22-23, depending upon now-allowable claim 19 and reciting further patentable subject matter, are seen to be allowable and allowance is requested.

Claim 24 is currently amended similarly to claim 14 to include “so as to create openings in said textile penetrable by said fluid precursor.” Claim 24, depending upon now-allowable claim 23 and reciting further patentable subject matter, is seen to be in condition for allowance and allowance is requested.

Claim 25 was objected to because the word “menas” was not deleted in the previous amendment.

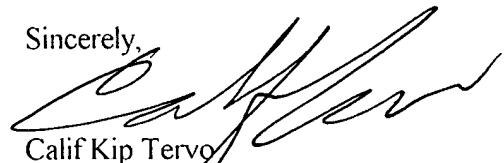
In the amendment filed 08/20/2003, the word "menas" was presented in strikethrough text, which apparently was not perceived by the scanner. Claim 25 is currently amended to present the word "menas" within double brackets to indicate deletion. Amended claim 25, depending upon now-allowable claim 19 and reciting further patentable subject matter, is seen to be in condition for allowance and allowance is requested.

New claim 26 is added to include the condition "and wherein said composite coating covers substantially the entire surface of the wall." This condition is implicitly supported by the specification because the fluid precursor is described as preferably sprayed onto the surface of the wall (page 6, line 19); because the method of covering corners and seams where walls, floors, or ceilings meet is detailed on page 9, lines 4-30; because it is stated on page 9, lines 31-33, that edges of cloth pieces should overlap by 6-12 inches (implying coverage of areas of the wall surface that are quite large in comparison to the fabric used); and by Figure 1.

New claim 27 is added to include a coving for creating a radius in an interior corner. Coving is supported by the specification on page 10, lines 4-11 and by Figure 2; the preferred radius is supported by the specification on page 9, lines 26-28.

The Examiner is requested to contact the undersigned at (619) 234-4034 if it will aid in the disposition of this application.

Sincerely,



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